Exhibit #534

MACKENZIE VALLEY PIPELINE INQUIRY

EFFECTS OF THE TRANS-ALASKA OIL PIPELINE CONSTRUCTION PHASE ON FISH AND WILDLIFE MANAGEMENT

by

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It would be a grave mistake for me to give or for you to accept a simplistic analysis of this topic. Let me illustrate this warning: as 20,000 pipeline workers, families, and support personnel in 1974 began to choke Alaska's frail service facilities, we braced for massive assault from greatly increased numbers of hunters and fishermen, and contemplated reductions in bag limits, open seasons, and other regulatory responses to intensified pressures on consumable resources. To date, this has not happened in Alaska; there has been no discernible jump on the curve of increasing resource pressure. True the median horsepower of riverboat outboards on Interior Alaska waterways seemed to double overnight--seemingly a result of big pipeline salaries, and poised to drive the new waterborne moose hunters and pike fishermen ever farther and faster into remoter regions of the Interior. But harvest statistics seem to indicate that this fancy new fleet did much strutting, and precious little harvesting of Interior Alaska's otherwise beleaguered moose stocks and fish resources. Perhaps the nouveau riche pipeliners had time to buy boats, motors, and rifles then, but working 6 or 7, 12-hour shifts didn't give them time to use these in pursuit of fish and game. Maybe now we'll face a delayed effect in 1976, as work weeks have been cut back to more humane levels, and the high-powered toys are still there. So, if you were anticipating straightforward cause-and-effect scenarios from Alaska, I must tell you they are not forthcoming from the biologists. Lots of changes in Alaskan wildlife management have coincided with the construction phase of our pipeline, however. While many of these effects would be difficult to attribute uniquely to the pipeline phenomenon, I wish to

concentrate on those which in my view are, if not uniquely attributable, at least strongly implicated. And, though you may be surprised when I've done, that I see a number of positive potential effects of the pipeline, my view is tentative, short-range analysis and deliberately hopeful. Nevertheless, for the record, I am no cheerleader for pipelines; I wish we never had a pipeline thrust upon us, and other things being equal, I hope you as our next door neighbors can somehow escape having to put up with one.

In analyzing these effects, I shall resort to three categories:

Institutional effects,

Philosophical effects, and

Surprise effects, on wildlife management.

I should like the Inquiry to be aware that the following testimony is not a repetition of the content of my article: Pipeline Surveillance from the inside : fish and wildlife perspectives, which I believe Dr. Lent submitted for the record earlier. However this testimony builds on and supplements the content of that article. I assume that members of the inquiry are familiar with the article.

Further, I shall submit several items to substantiate points in the following narrative:

- A letter from myself to Allan L. Carson, dated October 14, 1975, together with notes and observations on my trip to Foothills Pipelines Ltd. in Calgary.
- A letter from myself to M.P. Wurmekeus dated January 12, 1976 discussing joint surveillance teams.
- An article from the Fairbanks Daily News Issue by R.A. Fineberg

dated March 8, 1976, concerning JFWAT and in-stream construction.

Institutionally, the principal result of the pipeline in Alaska has been the implementation of the Joint State/Federal Fish and Wildlife Advisory Team, JFWAT, or Joint Team for short. This team functions as a unit physically, apart from parent agencies, U.S. Fish & Wildlife Service and the Alaska Department of Fish and Game. The Joint Team, under one roof, is also separate from the Alaska Pipeline Office and State Pipeline Coordination Office.

Very simply, joint teams of JFWAT are the best outcome, the cutting edge, and the hope of the future that we have been forced to implement, primarily in response to the Alaska pipeline. The advantages of joint teams lie in the blending of local, site-specific expertise, with wider experience and broader perspectives of the federal type. Combined location and administration of local and federal biologists has proven to be more efficient than running JFWAT through its principal parent agencies -- the U.S. Fish and Wildlife Service and the Alaska Department of Fish and Game. Where the stipulations for grant of right-of-way were not adequate to safeguard fish and game resources, JFWAT biologists could apply either state or federal statutes and regulations to cover the loophole. This application of pre-existing state and federal authority has proven to be the most important facet of JFWAT, and therefore our most interesting institutional experience by which to examine effects of the oil pipeline construction on wildlife management. Early on, we discovered the relative power of Alaska Statutes Title 16, which statute emplowers the Commissioner of Fish and Game to regulate virtually

any activity that could alter the physical and chemical environment of fish streams. Such regulatory power stems directly from the State Constitution which establishes the state's sovereign power over resident wildlife, regardless of land ownership within the state's boundaries. So, when base stipulations fell short in their protective powers, Title 16 could be applied as a second line of defence, whether the land was federally, state, or otherwise owned. Three situations most commonly gave rise to failure of stipulations: 1) JFWAT's "advices" to state on federal pipeline officers are not binding, and these officers can in fact ignore or overrule the biologist's best judgement; 2) lease stipulations simply do not apply to certain pipeline related construction, chiefly the haul road north of Fairbanks; 3) time was too short to go through the advisory memo raindance, or the lease stipulation simply was not adequately stringent in certain cases.

Within JFWAT at first, there was a bit of friendly jealousy, completion, what have you, from the federal biologists over the state side of the team's having a weapon in its arsenal that the feds lacked. This competitive spirit quickly gave way to fuller partnership as soon as the federal biologists discovered their own relatively greater power through the Endangered Species Act, and Fish and Wildlife Service Regulations concerning aerial harassment of big game, to supplement the stipulations.

Joint teams can have a distinct long-term benefit in stimulating the formulation of better and more equitable management on either national or local sides. For example, if there is currently no substantial territorial prerogative to protect fish and wildlife habitats, perhaps

the prospect of territorial and CWS biologists having joint jurisdiction over a right-of-way during pipeline construction, will nudge the development of territorial responsibility and expertise. A more concrete example is that just now, Alaska Statute 16 is being rewritten, with input from biologists who are thoroughly aware of its imperfections through applying it on the pipeline. As 16 needed tightening up in its comprehensiveness and legal terminology, which process is well catalyzed by the federal/state experiences in the last 2 years.

To underscore the point that Alaska looks to increasing use of joint teams in the future, we have taken steps to extend the joint team principle to other activities in Alaska. I am currently involved in managing environmental research on the Alaskan Outer Continental Shelf, as one of three state employees working among a majority of federal scientists and administrators of the National Oceanic and Atmospheric Administration. Of all the coastal states with offshore oil prospects, only Alaska so far has committed professionals to work full-time in environmental assessment research and application planning. The result is that Alaska now has in effect a day-to-day tracking mechanism on marine environmental research, and can continuously articulate its environmental concerns, its research needs, and its management priorities to the federal behemoth. I project that much time and money will be saved by this tactic if we can head off future litigation actions.

Cooperative state/federal management of certain land areas are a fundamental tenet of the state's proposal on national interest, or (d) (2) lands, now up for public review in Alaska.

There were three major shortcomings of JFWAT in retrospect, all

direction of biologists, particularly in northern, sparsely inhabited territory where water quality is less of a public health consideration than it is in more southerly latitudes.

In summary, pipeline biologists in Alaska would now favor the extension of the joint team approach to a single environmental and habitat protection office for our pipeline, with authority equal to that of the current state and federal pipeline offices.

Now I am making self-critical and analytical remarks here in hopes that they will be useful to Canadian environmental protection efforts. I am strongly recommending a joint team approach, I should also caution anybody listening against viewing this approach as a magic solution.

First, anyone proposing to implement a joint team in northwestern Canada may face the objection against adding a new tier of bureaucratic control, that will add to the cost of environmental surveillance and construction costs on a pipeline. That objection can be disposed of easily by a cost analysis in the Alaska situation, although "advisory" status for biologists has reduced the cost-effectiveness of JFWAT's efforts.

The second cautionary note is that it may be difficult to achieve or re-create the chemistry and togetherness of JFWAT. It is difficult to imagine finding the magic combination of personalities, approaches to problems, and overall dedication in the same fortunate way that it all came together in Alaska. To illustrate this point, let me point out one of the paradoxes in the Alaska surveillance effort. Jim Hemming, the supervisor of the federal half of JFWAT is in a line

position with APO. This means that occasionally the chain of command on the federal side can box Jim in -- for example he may be specifically uninvited to participate in a decision-making meeting with Alyeska by Andy Rollins. Al Carson, the state supervisor, can in these situations exercise more leverage with Andy Rollins and APO from outside than Jim can from within. It is acknowledged fact between Al and Jim that Al can open doors with the federal machinery for Jim because of his independence and because Al rises to this form of challenge and confrontation with relish. This little irony works the other way too, as Jim can offer outside leverage with Chuck Champion and SPCO in Al Carson's behalf, although Jim's approach and psychology are markedly different from Al's. Jim is diplomatic, cautious, and highly sensitive to, and respectful of lines of authority. In short, these two make an ideal combination as dual heads of JFWAT.

The third caution is what we came to know as the "double standard problem" or stab-in-the-back routine. This topic leads gracefully into my next topic, that of JFWAT's relations to other agencies. JFWAT is pretty adequately funded and adequately staffed for its job. By comparison with traditional regulatory agencies they are flush. This iniquity leads directly to iniquities in application and enforcement of environmental standards. The Habitat Protection Section of the regular Alaska Department of Fish and Game has a staff of 2 professionals for the whole of Alaska north of the Alaska Range. These two biologists have to oversee road building, stream-related activities, mining, logging, seismic work, offshore drilling, etc., over this vast area, while 30 biologists for JFWAT concentrate their attention in the narrow

ribbon of the 800-mile pipeline corridor. Occasionally, when some of the projects the Department oversees are within sight of the Alyeska project, Alyeska has screamed "double standard" because they perceived a contractor or a miner getting away with something for which JFWAT would have nailed Alyeska's hide to the wall. It is much to the credit of the overworked regular Habitat Protection Section that these charges never held up because their regulation and enforcement were always good. Unfortunately, other state agencies have given us more headaches. We worked diligently to keep Alyeska from altering stream banks and the active floodplain close to productive chum salmon spawning grounds on the Tanana River. After a long hard fight, we secured satisfactory design changes from Alyeska in 1974. Now in 1976, I've discovered that the Alaska Department of Highways got away with road construction in this general area of active floodplain and spawning grounds. The habitat may not have been damaged, but the appearance of letting a state agency do something Alyeska was not allowed to do damaged our credibility, and JFWAT felt as if Highways had stabbed them in the back. Enforcement of Department of Environmental Conservation regulations and Department of Natural Resources regulations in the Fairbanks vicinity also have been or have appeared to be more lax than similar applications upon the nearby pipeline corridor. It is fair to say that all of these agencies are envious of JFWAT's privileged support level. During my tenure with JFWAT, I spent much time bent over backwards to cooperate with regular state agency offices so that envy would not ignite into outright jealousy.

As overriding type of jealousy continues to divide the whole surveillance apparatus between biologists and engineers needlessly and

counterproductively. An incident on the Tonsina River illustrates the gulf and professional distrust nicely. As biologists, we were hounded incessantly to come up with hard numbers of fish and caribou, hard evidence that a creek was indeed a fish stream, hard number predictions of exactly how much silt a spawning bed could survive. Judgement was not acceptable to Alyeska or surveillance engineers. These engineers somehow wanted us to whip out a slide rule to produce answers for them. Engineers could always sound so confident and quantitative in their predictions, so, dammit, why were the biologists such lazy people; why hesitant to predict; why reliant on such soft data? With much fanfare, speeches, press, photography, ribbon-cutting and expressions of confidence, the first river crossing took place in March 1975 at the Tonsina River. The pipe was lowered into the water by a fleet of side booms, and carefully weighted with concrete saddle anchors. No sooner had all the dignitaries gone home with the project engineer's remark ringing in their ears that Alyeska had come to the river crossing, "not to praise the pipe but to bury it," than the pipe bobbed to the surface, as the saddle anchors slipped off one by one, like dominoes. Next morning, in a meeting at SPCO, several of us JFWAT biologists were laughing heartily over this embarrassment to Alyeska's engineers. After all, we'd had our predictions so often ridiculed by Alyeska, it was a touch of delicious revenge that we could now point to their fallibility. Erroneously, I expected that Chuck Champion and his staff would join in our mirth. He did not. Rather he defended Alyeska and the soundness of the river crossing design, dismissing the mishap as something inconsequential. Chuck

Champion was trained as an engineer and in this situation, he defended the guild of engineers against the guild of biologists rather than join the laughter as an environmentalist, at the expense of industry. The jealousies between engineers' and biologists' guilds are a serious impediment in Alaska, that I expect will continue in Canada for some time.

It was more or less natural to create the chief surveillance officers' positions for both federal and state as slots for engineers. But perhaps that casual assumption needs close re-examination for future pipelines. What is to prevent a biologist or other professional from being an effective chief surveillance officer on pipeline construction?

DO-ABILITY

In December 1974 JFWAT held a convocation of all its professionals and staff, during which we played a disarmingly simple game popular among management and executive circles, known as "means-ends analysis." The object of the exercise is to sort out what an organization does from why it does it, to prioritize objectives, and if truly successful, to come up with one super objective, to which as many tiers as necessary of sub-objectives clearly relate. JFWAT had been in action 6 months by then, and I thought it high time to find out how many or few "yard-sticks" the 30-odd professional biologists, both federal and state, were carrying in their minds, by which to gauge the correctness, relevancy, and effectiveness of their individual and collective efforts in pipeline surveillance. I was pleasantly surprised to find that within an hour, the group had come up with essentially one statement of overall

mission: "To preserve the viability and productivity of fish and wildlife habitats associated with the pipeline, and the broadest possible range of management options remaining to others upon completion of JFWAT's role in surveillance." Discussion dallied only over the words, not the substance of this statement, and I concluded that this was indeed a healthy organization of dedicated men and women, given that they had so little trouble in articulating a single mission statement. JFWAT is not an office, not a commission, it really is a team. Within other pipeline surveillance offices -- federal Alaska Pipeline office, State Pipeline Coordinator's office -- I strongly doubt that such a unified statement could be derived, even today. It was no accident that we, frequently encountered opposition to our recommendations in the field from the federal or state officers we were supposed to be advising. They seemed to be wearing Alyeska hats in seeking to cut construction costs at the expense of environmental considerations. The real reason lay at the same level as our perception of mission: had either office sat down to define its mission, either would have to face the hard reality that it had two contradictory roles to play, of equal importance to the Department of Interior and State of Alaska. One was protection of the environment through guaranteeing integrity of the pipeline, and the other was making sure the pipeline was completed on schedule, despite the environmental half of their mission. These missions should somehow be separated in the future because of their conflict. Moreover, advance planning should allow for delays, to wrestle with problems including fish and wildlife habitat protection.

If there is no programming for unanticipated problems for joint head scratching by environmental and construction interests, the biological and environmental concerns will end up ceding all important flexibility in major design elements of a pipeline to the tight construction scheduling mandate of industry.

Since I have been critical of the way in which surveillance of the Alaska pipeline was set up, let me propose another way of allotting the overseeing of pipeline construction in another place or at another time. This scheme uses the same or fewer professionals overall, and avoids the problems of vesting contradictory functions in the same office. To the extent that institutional planning can facilitate the eventual work of surveillance, it may be worthwhile to review several schemes for their suitability to the Canadian situation. The present scheme puts each of the three elements on the same level. Each needs the authority to selectively or completely shut down construction through lease stipulations, and to prosecute through state (territorial) or federal laws and regulations.

APO (federal) facilitation pipeline integrity, aesthetics	JFWAT fish & wildlife Habitat Protection	SPCO (state) facilitation pipeline integrity, aesthetics	N O W
Joint Office of Pipeline Coordination facilitations, permits, procurement, logistics	Joint Environmental Team habitat protection, water, air quality	Joint Office of Pipeline Integrity Assurance integrity, aesthetics, engineering	FUTURE

Figure 1. An alternative organizational framework for overseeing pipeline construction.

Finally, under the heading of institutional effects, I should characterize the JFWAT field surveillance biologists, so that you can draw a comparison between traditional management biologists and this new breed. Although they differ among themselves greatly in styles and backgrounds, the successful surveillance biologists with JFWAT share an uncommonly high degree of dedication and environmental concern. A number of times pipeline laborers and others expressed their bewilderment that JFWAT biologists would work such long hours at comparatively low paying "government" jobs. "Do you guys really work for the government?"

Joint Team biologists' educational backgrounds, being mostly masters' or PhD, had exposed them to original scientific inquiries and the requirement for articulating new findings to others. Perhaps for this reason, we could rely on our field personnel to have adequate to excellent communications abilities, to be sufficiently assertive in leading discussions and problem-solving sessions with non-biologists, and above all, to exercise good judgement. And, in many cases of confrontation, the element of simple courage becomes important. Resourcefulness and tolerance for the special loneliness of being surrounded by hostile points of view on a day-to-day basis are also hallmarks of playing biological "cop-behind-the-billboard."

On the not-so-pleasant side of the personality profile, JFWAT biologists certainly developed a heightened sense of distrust, or higher threshold for believing much of what non-biologists wanted them to believe. Moreover, I worried continually about the signs of stress and emotional exhaustion often evidenced by JFWAT field staff. If I chanced

to meet one of these biologists in transit at the airport, with a duffle-bag and cold weather gear, one look at their face and posture usually told me quite eloquently whether they were on the way out to a 10-day tour, or were on the way back to town after such a tour. Unless the returning biologist happened to be flushed with a sense of triumph over a point agreed to by Alyeska, he appeared weighed down by worry and responsibility. Of the four days off every two weeks on a normal surveillance rotation, most biologists reported fretting away the first two days, reliving all their decisions of the just-completed tour, and worrying that their alternate would keep lids on the critical situations in their absence. Only on the third and fourth days of leave could most of them relax and unwind. Despite the frenetic pace, physical strain, and a not always cheery won-lost record, a number of JFWAT biologists, myself included, came around to enjoy the challenges of the mammoth project, especially the feeling of being in the forefront of attempting something unprecedented in history. In particular, many of us have been quite acutely aware of the potential for influencing patterns and standards that might be adopted for future oil and gas pipeline construction surveillance in Alaska, Canada, and elsewhere.

The personal stake a number of JFWAT people have invested in their roles is, in short, considerable. I have a vision of a white-haired gentlemen, sparing no expense in the year 1995, with a son and a grandchild in tow, making a sentimental small plane landing at one overgrown airstrip on Alaska's North Slope. There, for a few hours or days the veteran JFWAT biologist would show his lineal descendants some of the streams the world first came to know 20 years earlier through his efforts.

He will point out this or that feature of a stream crossing, and reminisce about the way he argued with industry for consideration of the stream as a fish stream back in 1974. And if granddad can see elements of his own design-influencing decisions still intact, plus healthy school of grayling in nearby deeper pools, this will be a moment of great personal satisfaction. I don't think this is a far fetched scenario.

Now, Id like to move on to a discussion of philosophical effects of and lessons from the Alaskan pipeline construction period. Wildlife management approaches necessarily develop in concert with the ratio of human biomass to wildlife biomass. In vast regions with sparse human populations, management of populations through regulation of harvest is the approach of choice. With escalation of human resource pressure and management manpower, stock management is augmented by critical habitat protection, and somewhat further along in this progression, by habitat modification. Throughout most of Alaska, the era of critical habitat protection is just beginning. But on the pipeline corridor it is in full swing. Between August 1974 and December 1975, JFWAT personnel issued some 1500 written directives known as field advisory memos. Of these actions, virtually all dealt with habitat protection measures. About 80% concerned aquatic habitats, and only 20% or less with terrestrial habitats. The interpretation of these numbers requires some care, however. The grand total of 1500 permitting actions and non-conformance reports by JFWAT during this 16 month period is an underestimate of the work load because many minor advices are handled without putting it in writing. The virtual absence of "stock management" actions derives from two causes. First, by mutual agreement with the managing divisions of

the Alaska Department of Fish and Game (Game, Sport Fish, and Commercial Fish) they were to take on any problems dealing with individual animals. JFWAT, for example would undertake to prevent creation of attractive nuisance situations--garbage and outright feeding--but once bears, foxes, and wolves actually materialized and had to be dealt with, Game Division biologists took the responsibility. Or again, cases of aerial harassment of big game we gleefully turned over to the U.S. Fish and Wildlife Service for prosecution on regulatory and statutory grounds outside provisions of the Right-of-Way Lease Stipulations. A second reason for no stock management activity is that north of the Yukon River there is a 10 mile wide area, centered on the pipeline alignment, closed to sport fishing and the taking of big game. Moreover the entire pipeline right-of-way is closed to tresass, including camping, hunting, and fishing by Alyeska corporate policy.

The closure north of the Yukon stems from a 1970 state legislative Resolution which directed the Commissioner of Fish and Game to declare such a closed area on the Trans-Alaska Pipeline System's (TAPS) haul road, which at that time was only complete between Livengood and the Yukon. That road was accepted by the State, i.e. became public in 1972, but the legislative intent to prohibit the privileged few from using a private road for hunting and fishing before the public had a crack at it was transferred north of the Yukon in 1974 with the start of haul road construction north of the Yukon. The future status of the haul road north of the Yukon is a subject of current public debate. Should the State of Alaska take it over as a public road (as it was once assumed would be the case) there is the question of whether they

could afford to maintain it. Native and environmental groups are opposed to adding this road to the highway system, largely because of the anticipated dramatic increase in pressure on renewable resources. Wildlife Management in that corridor north of the Yukon is likely to become and remain neither entirely stock management nor habitat management, but access management for the foreseeable future.

So, in summary, the pipeline and related activities have advanced the clock in a sense on wildlife management approaches to the stage of primary emphasis on habitat protection within a narrow band across Alaska. It is likely that, with the growth of the Habitat Protection Section of the Department of Fish and Game, and with the significant number of JFWAT alumni, a shift in wildlife management approaches will be catalyzed by the pipeline experience in Alaska.

Preoccupation with habitat protection runs immediately into problems of execution and education in the pipeline scene. Countless times, when he grew weary of our continuing objections over certain design features of the pipeline, Chuck Champion wagged a finger in my face, saying "You guys have got to realize this pipeline can't be built without killing some fish." Chuck is probably still saying that to JFWAT. Hang up is the phrase. Chuck and all the non-biologists along the line tend to be hung up on the perception of biologists as people out to save every individual fish from an early death at the hands of construction, as if we should be giving out a quota of hunting licences. Hung up on the image of wildlife managers as stock managers rather than habitat protectors. Somehow I doubt that we biologists ever made it

clear that we could accept tolerable construction-caused mortality, so long as the habitats, as the physical and biotic "vessels" of wildlife production, could be maintained easily recreated in near original state. This is a problem of education of non biologists that we might have done a better job with, and that would persist in Canada, or any such area where virtually everybody knows enough about wildlife biology to be a self-made expert.

Since the pre-pipeline construction background biological studies were inadequately funded to learn everything we needed to know about habitats, populations and biological processes, along the pipeline right-of-way, there were many things JFWAT biologists learned, particularly about streams and fish, at the eleventh house, so to speak. When you can hear the churr and squeaks of approaching bulldozers, and at your feet is a stream that gives every indication of being a productive fish stream, but has never been documented to contain fish, you are in a tough spot if you recommend that the stream be treated as a fish-bearing habitat. The burden of proof of why the industry should bear extra cost of minimizing in-stream activities, and providing adequate drainage structures, lies with the biologist. JFWAT has a fairly long list of actions in which biologists made the strongest possible recommendations in the absence of hard evidence, only to have them turned down, and then the evidence comes in. However satisfying it is to be proven right in a judgment situation, the "I-told-you-so" pattern in JFWAT's history has always indicated a failure of the process of environmental protection.

Challenged one day by construction personnel, one of our

biologists laid his judgement on the line. They had done the expedient thing by laying a piece of 18 inch steel pipe (VSM discards) across work pad construction to pass the flow of a small stream from one side to the other. For the biologist, this was not good enough during the late stages of spring runoff, given that we were pretty certain that this stream was a grayling system though we had not proved it. News spread that biologists were unhappy with the constriction of this freshet. Upset professionals of both persuasions converged on the stream. "So you don't think this is a fish stream" inquired the JFWAT biologist. "What do you think this is?" pause as he walked over to the outfall end of the pipe, reached down into the pool below and scooped up a stranded 10 inch grayling. "I call it a fish, and there are lots more like this one which could not make it through that tube to spawn upstream of here during the spawning period." That dramatically ended discussion, and a decent-sized culvert replaced the 18" pipe in short order. Incidentally, the creek became known officially as Million Dollar Creek, following charges and counter-charges that a few lousy fish would cause Alyeska to spend a million extra in coddling the environment and environmentalists at this one creek.

There is certainly an unequal burden of proof borne between biologists and construction personnel in our society, and I suspect we have it entirely backwards. Anglo Saxon law holds that a person is innocent of an abuse until proven guilty beyond a reasonable doubt. So the would-be user of the environment is smart to figure out what he can reasonably expect to get away with in terms of environmental abuse, and still leave his peers a reasonable doubt as to the unequivocal assigning

of guilt in a court of law. On the other hand, our emerging Anglo Saxon environmental conscience and awareness, that take the forms of the U.S. National Environmental Policy Act of 1969, and give impetus to this hearing seem to require that the burden of proof be shifted to the user, or applicant, or potential ecological wrongdoer. By that I mean the user is supposed to show beyond a reasonable doubt that he is cognizant of environmental consequences of his actions and capable of conducting his operation at a low enough level of risk as to be acceptable to the common good. In some cases, that burden of proof is actually realized as a bond, or monetary insurance levy, which guarantees the underwriting of cleanup costs following oil spills, for example. But the JFWAT field biologist still confronts the situation where he has to carry the weight, as if he were an accuser or prosecuter in court, rather than something more like a coxswain in a crew shell.

Among the things that consumed more of JFWAT's attention than I would have imagined, the problem of animal feeding was perhaps most frustrating. No amount of educating, warning, or threatening seemed to make any dent in the human trait of wanting to feed large carnivores, and secondarily to bring them in close for photography. When the argument that deliberate feeding was bound to create helpless dependants out of wild creatures did not work, we tried to impress workers with the health hazard, particularly from arctic foxes, of contracting rabies. That approach seemed to have no effect on the rate of feeding incidents either. Meanwhile, Alyeska was enforcing a company policy of firing any worker caught feeding animals, with equally unpromising results. Because union labor agreements prohibited blacklisting, a terminated worker from

one camp would be returned to town, yet he could be rehired within hours at another camp. In hindsight, animal feeding should have been made a criminally punishable offense, through regulatory or statutory means. I fault the Department of Fish and Game for not implementing this provision in the early stages of construction. If it had, then the effectiveness of Alyeskas well-intentioned hire/fire policy would not have mattered. Going behind bars is a far more persuasive threat than is the temporary inconvenience of an interrupted wage, free trip to town, and change of scenery to another construction camp.

JFWAT has a terrible problem of getting its story told where it needs to be heard. Appallingly little is known about the good and bad aspects of the Alaska pipeline surveillance picture outside of limited circles. The U.S. decision makers, planners, and public critics who should be most analytical of, and influential upon ecological implications of future energy transportation options have, I think, largely tuned out the experience on the Alaskan oil line. They believe that the Alaskan environmental concerns were dealt a bad hand with the Senate ratification of the "Spiro Agnew pipeline." I agree, it was a bad hand. But it is alarming that their analysis stops there, rather than probing the surveillance experience more deeply to see how much can be salvaged, or how skillfully that bad hand can still be played. I can't escape a belief that more bad hands will be dealt in this part of North America; but I hope some skillful players will rise to the challenge when that happens.

Another possible problem is that biologists who become involved with construction surveillance may be regarded with suspicion by the

unsullied, sincere environmentalists, who don't get paid to be environmentalists, don't leave to face the same issues of construction problems day after day. When it gets down to a choice between two ecologically bad construction options, and realistically, the only way out is to select the less evil method, I'd prefer to still have at least enough say to pick that method. Dealing with the high speed construction process in this sense is not unlike dealing with a skunk. As long as he faces you, there is hope. Once he turns his back, at close range, hope diminishes ... fast. Uncompromised environmentalists don't do such things as making the best of bad situations, keeping skunks oriented, and pacing bulldozers at work. That is regarded as something like biostitution. So, in summary JFWAT is having trouble finding an understanding audience to tell what it has learned.

Another surprise for me was that industry does not always do things according to logical principles such as cost effectiveness. There is a lot of complex illogic in the selection of one technology, design feature, or construction method over another -- in large part attributable to inertia, or the comfort of familiarity. Elsewhere I have discussed low water crossings (LWC's) in this regard. It would have been enormously useful to all surveillance efforts, especially to biologists, to have been forewarned about the motivations of industry. At the outset, it would have been a help to know what was on Alyeska's menu, then to have had a candid analysis of the kinds of thinking Alyeska and contractors would do in selecting among the alternatives. We might then have shortcut a lot of debate and non-communicative meetings about

LWC's, and river training structures. In many stretches where alignment required burial of the pipeline in active floodplains, Alyseka chose shallow burial and extensive groins and dikes, rather than deep burial without these river training structures. Such structures are particularly unattractive biologically, altering as they are designed to do, the hydrologic will of stream habitats. So we took an active interest in this design feature, and were told in ever so strong language how vastly more expensive deep pipe burial was than shallow burial with river training. When we asked if the costs of constantly inspecting, maintaining, and replacing dikes, groins, gabions and so forth had been figured in to the cost effectiveness analysis, we got no consistent answer at all. Only after much probing did we get a hint that resorting to river entrainment structures requiring maintenance during the operating life of the pipeline, might be viewed as a tax shelter by Alyeska. The consortium expected a considerable tax write-off in the future through claiming maintenance expenses. I won't vouch for the accuracy of this analysis, but it rings true as a perverse cost effectiveness ploy. Curious that Alyeska could be so far seeing on items like this, when so often, they would inform us with 5 minutes' warning that they'd just discovered a need to have a number of earth scrapers on the opposite side of some fish stream, and would we issue them a permit to ford it?

The last topic I want to touch upon is the matter of authority. Already, we've explored how APO and SPCO are supposed to have authority over environmental considerations in pipeline construction, through the lease stipulations. These offices actively downplayed or suppressed any

exercise of ecological authority by JFWAT over construction practices, and were acutely uncomfortable at the hint of our exercising title 16 authority, which was clearly beyond their control. Be that as it may, I draw your attention to the fact that authority, leverage, or persuasiveness relies on the degree of threat posed to industry when they do not cooperate. The most startling thing about the whole pipeline surveillance process that I have learned since leaving that activity is the existence of a steady erosion of environmental leverage that is supposed to be guaranteed through the stipulations. Two major kinds of clout existed in the two pipeline offices: First, they held the power of turning on construction through grants of notices-to-proceed (NTP's). Holdups in these meant slowdowns and lost time and money. Second, they held the power to shut down work on the project.

As the number of NTP's remaining to be granted has dwindled, so have APO's and SPCO's leverage with Alyeska. And as the power of shutting down construction has gone unexercised except in extremely circumscribed locations and situations, that has become an emptier and emptier threat. There were a number of junctures when both types stipulatory authority could have been brought down with great effect. Most notable would have been at some point when the Quality Control of Alyeska was first discerned as deficient, and deceitfully deployed so as to hide variances between execution and design from the surveillance effort. I shall illustrate very simply what Quality Control should be, but is not doing, and what this means. Provisions for animal crossings of above-ground sections of pipe were designed into the overall plan with the co-operation of JFWAT. These crossings were generally at a given

frequency, and determined by minimum ground to-bottom-of-pipe clearances, such as 10 feet. Now the checking of what gets built in the field against the blueprint, or specifications, is the job of Alyeska's Quality Control and Quality assurance program. But the near total failure of this effort has consumed JFWAT's time in doing QC work by measuring these crossings for correctness.

JFWAT's function in animal crossings should have been to check that moose and caribou were actually able to get through the crossings as designed and built, without unduly long excursions along the pipeline and work pad. What makes it doubly time-consuming is the shocking non-conformance rates -- 30, 50, 70% in some areas. It is now so late in the process, that APO and SPCO really cannot undo the damage left by the absence of Quality Control effectiveness. If those offices had acted swiftly and decisively to whip QC into shape, then biologists could have spent more time doing biology rather than measuring pipe clearances, and would not be forced to spend much time insisting on bandaid remedies for damaged habitats (such as excavating to make the clearances meet specifications).

I've made this final point in hopes that the authority mechanisms chosen in future projects will be Rivers that are just as big on the final day of construction as on the first.

Alyeska stream crossing

By RICHARD A. FINEBERG
Staff Writer

An Alyeska scientist described pipeline stream crossing schedules as "comfortable" Friday, but members of the state-federal Joint Fish and Wildlife Advisory Team (JFWAT) are decidedly uncomfortable as they view the same Alyeska agenda.

To the JFWAT biologists, the critical element in the schedule for each fish-producing stream is the "window" that closes construction during periods when in-stream work might kill fish, silt spawning beds or otherwise damage fish habitat. For many streams, the window closes with break-up.

In some instances, when a window closes this spring, pipeline work must be completed or the mid-1977 start-up date for the pipeline may be jeopardized, according to Dr. H.R. Peyton, a top Alyeska scientist.

The problem, Peyton explained, is that the pipeline must be hydrostatically (water-pressure) tested before it receives oil. Alyeska's plan calls for completing the pipeline portion of the project—and pressure-testing it—before cold weather makes water-testing unfeasible this fall. For this reason, Peyton said, winter crossings have to be completed before break-up this year.

But Peyton said Friday there is some slack or contingency time built into each stream-crossing work plan, and the stream crossings on the agenda for this spring should be completed on schedule. The scientist described the crossing schedule as "comfortable."

Peyton said the programmed slack would enable contractors to finish the Salcha River crossing, southeast of Fairbanks, on schedule. According to construction plans, the window at the Salcha closes next Monday.

Pipeline contractors, delayed by a series of problems they encountered with the Chena River crossing near Badger Road, did not start on the Salcha crossing until last week. The Chena

agenda worries biologists

pipe went into place Thursday afternoon, almost four weeks after that crossing began. Informed sources say the Chena crossing had been expected to take two weeks or less.

According to biologists, it is important the pipeline crews be out of the Salcha before salmon fry emerge from the gravel and grayling start migrating. The Salcha is described as one of the Interior's major salmon producers.

Members of the JFWAT team say they are concerned about the tight scheduling at the Salcha—and at many other rivers along the pipeline route.

The JFWAT biologists point to the dynamite blast triggered in the Chena Feb. 28 as an example of the kinds of problems that occur when the timing is tight. The river blast was estimated by one informed source at 600 pounds placed in 80 holes across the channel.

In-stream blasting usually is prohibited on the pipeline route, but ditching the Chena had been progressing slowly with normal dredging measures and contractors wanted to make up lost time by using dynamite.

Despite the opposition of JFWAT biologists, the state Pipeline Coordinator's Office gave Alyeska contractors permission to set the charges.

Grayling winter under the Chena's ice, but it is not known whether the blast affected holes in which the grayling are wintering this season.

According to Dr. Robert LeResche, chief of the state Fish & Game Department's Habitat Protection Division, the department considered asking Alyeska to remove the charges from the channel without blasting, but it was felt the hazards of removing the charges might be greater than the potential danger to fish habitat.

Neither LeResche or JFWAT field supervisor Al Carson would say whether Fish & Game will take legal action on the Chena blast.

506 B Elvey Building
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University of Alaska
Fairbanks, AK 99701

January 12, 1976

Dr. M. Pat Wennekens
Habitat Section
Alaska Department of Fish and Game
333 Raspberry Road
Anchorage, AK 99502

Dear Pat:

I want to resume an intriguing discussion we started here during your presentation at the Geophysical Institute in December. You will recall that you favored a limited surveillance force for OCS development made up of various agency representatives, but not "put under one roof" because of the basic healthy diversity you wanted to protect (and, perhaps, fear of another bureaucratic tier). In other words, preserve checks and balances within the system so that no one heavy-handed facilitator element could over-rule a cautious approach by other agencies to environmental regulation. I think I perceive what you are driving at, and agree with the objective, but not with your implied methods. JFWAT is an example of what I consider to have been a check on both Champion and Rollins' offices, and as an entity it strongly resisted the fatal embrace that either office offered by trying to pull JFWAT under its roof. But at the same time, JFWAT was a derivative organization, that pulled technologists physically out of their principal parent agencies: ADF&G and USFWS. The function of biological cop-behind-the-billboard on a high speed construction project is so demanding of time, so completely alien to much of the traditional ADF&G pofessionals' activities, and so utterly dependent on a coordinated team approach, that over the course of its existence JFWAT has centralized, or increased its one-roofism. I must remind you that I was odd man out in trying to remain operative from the Fairbanks Fish and Game office, an experiment we terminated after a year, with regrets.

I suggest that not having DEC involved in pipeline surveillance, apart from their normal "field offices" has been a first-class tragedy for the State of Alaska. Perhaps a well planned joint team made up of EPA and DEC personnel would have worked. It is essential that professional surveillance of high speed construction or development be done by persons with undivided commitments to that activity. Otherwise it gets away from your control, and you get caught in problems of enforcing different standards.

And in case I was not clear enough in this position, let me restate that I consider it absolutely essential eventually to have full-time surveillance teams on OCS development. Nor is it too early to begin serious planning for such surveillance teams. First, however, I would like to continue this discussion with you, because of your role in coastal zone work, and keen perception of the kinds of stipulations that will have to be applied.

If you carry out your threat to retreat to Interior Alaska for time to write and catch up, please save some time to discuss this general subject. The enclosed issue of Alaska Conservation Review contains some remarks of mine about JFWAT, plus other articles of real merit.

Sincerely,

Dave

David W. Norton
Biological Research Coordinator

DWN:tmj

encl.

cc: R. Le Resche
A. Carson
M. Smith
R. Weeden
R. Wright

UNIVERSITY OF ALASKA
COLLEGE, ALASKA 99701
October 14, 1975

Allan L. Carson
State Supervisor
JFWAT
628 "F" Street
Anchorage, AK 99501

Dear Al:

The attached material results from my recent trip to Calgary. Thanks so much for providing photographic support documentation, which I'll be returning to you in person on 15 or 16 October.

I don't know how much time you'll have to look over the enclosed material: (1) The trip notes are intended to serve as pre-briefing for any future contacts you have with Foothills, Lombard, or other Canadian groups. (2) Environmental Guidelines for Gas Pipeline Development probably would be worth reviewing in depth by someone like Rocky, in part for comparison with Alaskan stips and statutes. I've got no time to do that kind of review, but would be interested in seeing the results of someone else's digestion and commentary if you think it a worthwhile effort. (3) & (4) Maps and Foothills project description.

I just noticed an item left out of the trip notes: the problem of disposal or leakage of hydrostatic test fluid has them worried on the Foothills project, because of the vast quantities of methanol necessary for antifreeze in winter testing. No clever "surveillance" ideas came to me.

Best regards,

Sincerely,

DWN

David W. Norton
Biologist

DWN:tmj
encl.
cc: R. LeResche
R. Weeden
L. Bouckhout
P. Whitney

Notes on Calgary Trip by D. W. Norton

3 - 10 October 1975

(For Al Carson)

I went as a guest of Foothills Pipeline Company, Ltd., specifically their manager of environmental affairs (Frank Fisher's counterpart), Mr. Leo Bouckhout.

A. MY OBJECTIVES

1. To present the JFWAT experience with the Alyeska line in as fair a light as possible.
2. To try to discern with Canadian biologists the real vs. fancied environmental/biological issues during the construction phase of a pipeline.
3. To emphasize the importance of surveillance, preferably by joint local/federal agencies, in making sound decisions that benefit both industry and environment.
4. Establish friendly Alaska-Canadian contact to share northern experience.

B. PRESENTATIONS

1. I talked and showed pictures for 2 hours to Foothills personnel as a group on Monday 6 October, in which I reviewed:
   a. Alyeska's setting
   b. Congressional directives
   c. Grant of ROW and lease stip's-authority
   d. Organizational situation of APO, SPCO, JFWAT, DEC
   e. Costs of surveillance (cost effectiveness included under g below)
   f. Statutory and regulatory authority
   g. Cases for illustration: White Spruce re-route, culvert heaters, cat-in-Tanana, Animal feeding, material sites in Sag R., Lost Creek fuel spill, Low water Xings, Minton Creek, P.S. 2, Rosa Creek, sleeping bear.
   h. Recommended that environmental manager be real decision-making position within firm
2. Many individual conversations with engineers, consultants, procurement and logistics men over the next 2 days, in which I found the same gulf between engineer and biologist that we experienced with JFWAT initially.

   Learned of important qualitative differences between the Foothills project and other pipeline proposals:
   a. Foothills is challenging Canadian Arctic Gas Systems, Ltd. (CAGSL), as is El Paso. Their main route is similar, but is for Canadian gas only, designed to tie in to existing gas distribution systems within Canada, and to provide side lines to those communities in remote northern Alberta and NWT that want natural gas. Foothills is "David"

wanting gas for Canadian use on a modest scale opposed to "Goliath" (CAGSL) that would throughput gas to U.S. midwestern markets. Basically, Foothills' and El Paso's fortunes rise and fall together, since a nod to CAGSL's line would wipe out both of them.

b. Environmentally, a MacKenzie Valley line (CAGSL or Foothills) faces some different problems from the Alyeska line.

1) They plan no permanent haul road. Inlaying of supplies will be managed by summer barge transport down the MacKenzie from Hay River, and by snow/winter roads only.

2) Winter-only construction of the buried line is the goal, except for the restricted activity of assembling compressor stations, which can proceed during other seasons.

3) Construction camp size will be up to 500 man capacity, housing in winter the pipeliners, in summer the compressor station assemblers. Camps are planned at compressor station sites to facilitate this dual role. Camps are deliberately being located away from settlements upon which they might exert too much strain.

4) Environmentally, either MacKenzie Valley line faces a major flyway and staging area down the MacKenzie for birds such as we did not have. A smaller array of fish species is involved. Major ungulate movement back and forth across the valley is not a great concern. Line totally buried. Less permafrost.

5) Leo Boukhout intends not to permit gravel removal from active floodplains of tributaries or main channel of the MacKenzie by Foothills.

6) Institutionally, as we have discussed, the (Northwest) territorial government is very weak for local environmental control decisions. That is, federal regulations and surveillance only are foreseen, and in-house, self regulation by an operation similar to that of Fisher-Hilliker-Holland, Buhite, Ott, etc. may be much more important in the final analysis of environmental performance. (I worry about the fox guarding the hencoop, because what happens if a good man in that self-surveillance role is replaced by a bad one?)

3. Conversation with Vice President of Foothills (Mr. Howie ------?) in which I again stressed points above, particularly recommending visits by his environmental staff and consultants to the trans-Alaska construction phase, and that his environmental staff be given real power, not just window-dressing role. Foothills will likely be in touch with Al Carson, CAC, Gov. Hammond, Frank Fisher, Ernie Mueller* -- all of whose names and addresses I provided.

* Several people wanted to know exactly how waste water treatment was going, along with solid waste management, oil spill contingency operations -- This was the most painfully vacant area of my ability to respond to questions, and once again I pointed out that when surveillance by one lead agency is lacking, it becomes costly for other agencies and industry, both. *

4. Dinner at Leo Bouckhout's home, during which we discussed possible sources of competent surveillance biologists, deployment and scheduling problems, salaries and incentives. We had a fine, relaxed evening together.
5. Numerous conversations with Dr. Paul Whitney of Lombard North, consultants to Foothills, who is preparing testimony for the Berger Commission in Yellowknife challenging CAGSL's environmental information and safeguard plans. (Paul is a long-time friend from U/A grad school days.) Among the few things we disagreed over was the essence of what ecological safeguards are aimed at. He proposed that the maintenance of species diversity was the over-riding goal, while I maintained that habitat protection was the crux of the matter, since I doubt that extinction of species is a very likely result of any single industrial venture, and in any case is best guarded against by protection of all aspects of habitats of species. He might change his mind if he visits JFWAT in the field.
6. TV appearance -- see below.
7. Formal lecture at University of Calgary Biosciences facility ona subject unrelated to pipelining, after which faculty and graduate student questions turned to (degenerated to?) pipeline matters, about which all were very curious, and impressed that biologists have a real say in Alaska's situation. Intense debate of the merits of protecting one black bear's life during hibernation, while allowing destruction of nests of small birds in ROW clearing. Very interesting.

C. FEEDBACK

1. Expressions of real appreciation for my availability to present comments, however unofficial.
2. Widespread surprise at our finding and detailing MS and Ph.D. level biologists to surveillance -- a move I both defended and recommended to them in view of JFWAT biologists' demonstrated abilities to exercise excellent judgment between "ants and elephants."
3. I doubt that the merits of 'joint team surveillance' in the sense of local and federal personnel working side-by-side struck a responsive note, but after all this was not an audience of provincial, federal, or territorial agents, rather of industry itself (no more a monolith than "government" is).
4. Several persons had first-or second-hand knowledge of the pipeline in Alaska. I was asked "is it really true you guys shut down the construction for a hibernating black bear?" Another question concerned the shooting of a grizzly by a Native. One Foothills person had visited Delta Camp, and talked to Perrinis' management, getting a real earful of what unreasonable SOB's JFWAT was. Fortunately I was well provided with pictures of that whole sore spot area, and I think I injected balance to his perspectives. In short, JFWAT is way behind in the information game -- gotta get the story out!

5. Overall, I believe MacKenzie Valley pipeline proponents were impressed and relieved that "a shutdown" in Alaska so far has not meant 22,000 workers sent home to cool their heels for months, but has been a selective hold period during which real problems were worked out.

D. OTHER OBSERVATIONS

1. I was very sorry to see in Calgary elements of fragmentation in the "biological guild." That is, industry-consultant biologists have too little use for "academic" biology, and vice versa. My comment is: where would JFWAT be if these functions had not been brought together rather well in Alaska?

2. The first substantive evidence for the claim that U.S. gas should not be exposed to the "whims of a foreign power," came to me in an unexpected form. There is real and probably well-founded anti= Yankee sentiment in certain circles in western Canada. I would guess that popular opinion would, if given means of expression, favor Canadian gas for Canadian consumption -- and let the Yanks solve their own problems. It's much easier for me to be sympathetic with the idea of local resource control by Canadians, than it is with the propaganda that Canada is some evil-intended foreign power. There is a difference between international empathy between underdog proposals, and propaganda that fosters distrust. Enough on that non-biological subject.

3. The attitude of Foothills, Ltd. of being entirely open with environmental information was admirable. This attitude translated itself into a developing 1-hour TV documentary on the MacKenzie Valley pipeline alternatives, in which I was invited to participate, alone. I was videotaped for about 12 minutes' worth, giving the JFWAT-Alaska story. TV station officials were quite willing to make available this documentary for Alaskan TV audiences, when it is complete.

4 There is a tendency for those considering "environmental impact" of a project, to first think of what it will be like when all completed and operational. In other words, their mind skips over the whole process of construction as an environmental confrontation. Such skipping may be warranted in the case of, say, a nuclear power plant, an airport, or other highly localized endeavors. (For example, in my new position with OCS environmental assessment research, I've had to work hard to raise attention levels above zero on any possible environmental dangers other than a Santa Barbara type blowout of crude oil. Such a prospect is years in the future on the Alaskan OCS, and will be preceded by many other risk situations, such as gravel borrow, drilling mud disposal, spillage of refined products, onshore staging zones and port development, solid waste disposal, etc.)

Perhaps the Alyeska line is uniquely top-heavy with construction phase-related environmental problems, and it is proper that so much construction surveillance is in force. In JFWAT's presentations,

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E. FUTURE CONTACTS

1. For obvious reasons, I tried to ease myself out of the picture as a contact point, and identified Al Carson, Chuck Champion, and Frank Fisher as currently worthy and informed sources. Leo Bouckhout showed me a draft letter to Governor Hammond, requesting State assessment of the current pipeline situation -- essentially establishing lines of communication.

2. When quizzed about the possibility of visits by Canadian biologists to the Alyeska project, I encouraged visits on a frequent basis, but advised that dictates of the job at hand for JFWAT would indicate small groups rather than a boatload. And I suggested that 1-2 men be detailed to a section for a couple of days as working observers, who would then go to Anchorage to listen to the Thursday JFWAT coordination meeting. Bold as that was, I did not volunteer any suggestions on visits to SPCO's or APO's surveillance operation, or their willingness to entertain observers.

The whole week was pleasant, and I hope it will be judged constructive.

cc: R. LeResche - ADF&G
R. Weeden - DPDP Gov's Office
L. Bouckhout- Foothills
P. Whitney - Lombard North

Dr. Paul Whitney
Principal Biologist,
Western Region

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